

New Localities of Three Donaciine Species (Coleoptera, Chrysomelidae)
from Chiba Prefecture, Honshu, Japan, with Special
Reference to the Future Problems for Elucidating the
Donaciine Fauna in Chiba Prefecture

Kunio SUZUKI

Department of Biology, Faculty of Science, Toyama University,
3190 Gofuku, Toyama, 930–8555 Japan,

Itsuro KAWASHIMA

1–50–9 Nagasawa, Yokosuka, Kanagawa, 239–0842 Japan

and

Masayuki MINAMI

3–17–7 Kichijōji-Honchō, Musashino, Tokyo, 180–0004 Japan

Abstract Several new localities of the following three donaciine species from Chiba Prefecture, Kantō District, Honshu, Japan, are reported: *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE, 1885, *D. (Donaciomima) bicoloricornis* CHEN, 1941, and *D. (Donaciomima) clavareau* JACOBSON, 1906. Some comments on host plants observed in the habitats of each of them are given. A general survey of all the known collecting records of seven donaciine species belonging to three genera reported so far from Chiba Prefecture brings out zoogeographical problems of the donaciine fauna in this region to be elucidated. Of these seven species, *D. (Donaciomima) splendens hiurai* KIMOTO, 1963 should be omitted from the fauna of Chiba Prefecture.

Introduction

In the present paper we are going to report several new localities of the following three donaciine species from Chiba Prefecture, Kantō District, Honshu, Japan: *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE, 1885, *Donacia (Donaciomima) bicoloricornis* CHEN, 1941, and *Donacia (Donaciomima) clavareau* JACOBSON, 1906. A few collecting records have been reported so far for these three species from Chiba Prefecture. They were mainly collected in central to southern regions of this prefecture. On this occasion we will compile all the known collecting records of seven donaciine species so far reported

from Chiba Prefecture with some opinions and will discuss future problems for elucidating the donaciine fauna of this prefecture.

New Localities of Three Donaciine Species from Chiba Prefecture

In a check-list of animals from Chiba Prefecture, FCP SHM (the Foundation of Chiba Prefecture for the Study of Historical Materials) (ed. 2003) divided the land of Chiba Prefecture into the following six areas: Tone-gawa Teichi (lowlands along the Tone-gawa River basin; LT), Shimôsa Daichi (Shimôsa Plateau; SP), Kujûkuri Heiya (Kujûkuri Plain; KP), Tokyo-wan Teichi (lowlands along Tokyo Bay; TB), Bôshô Kyûryô (Bôshô Hills; BH), Bôshô Engan-bu (coastal zone of the Bôshô Hills; BC). In recording the collecting data, we adopted these major zoogeographical divisions of Chiba Prefecture, though they are considerably arbitrary and vague especially in indicating the localities of the species concerned on a small scale map.

Abbreviations of collectors' names in recording the collecting data — IK: Itsuro KAWASHIMA, SN: Shogo NISHIHARA, KS: Kunio SUZUKI.

1. *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE, 1885

SP: 2♂♂, 2♀♀, Hanajima (Hanajima Park), Hanamigawa-ku, Chiba-shi, 14-VII-2003, M. AYATO leg.; BH: 1♂, Kiwadahata, Kimitsu-shi, 20-VIII-2003, IK (on *Trapa* sp., Trapaceae); 2♂♂, same locality, 29-VII-2006, IK (on *Trapa* sp.); 2♂♂, 2♀♀, Sasa, Kimitsu-shi, 15-VIII-1989, M. HAYASHI leg.; many, same locality, 6-VIII-2007, IK, KS & SN (on *Potamogeton* sp., Potamogetonaceae)

2. *Donacia* (*Donaciomima*) *bicoloricornis* CHEN, 1941

BH: 3♂♂, 1♀, Kiwadahata, Kimitsu-shi, 20-VIII-2003, IK (on *Scirpus triangulatus* ROXB., Cyperaceae); 1♂, same locality, 4-VI-2006, IK; 2♀♀, same locality, 29-VII-2006, IK; 3♂♂, 1♀, same locality, 20-V-2007, IK; 1♂, same locality, 26-V-2007, KS; 1♂, 1♀, Nishioi, Ôtaki-machi, Isumi-gun, 16-VI-2007, IK (on *Typha angustifolia* LINNAEUS, Typhaceae); 6♂♂, 2♀♀, same locality, 23-VI-2007, IK; 11♂♂, 11♀♀, same locality, 6-VIII-2007, IK, KS & SN; 1♂, Takataki-damu (dam), Ichihara-shi, 10-V-2003, collector unknown.

According to HAYASHI (2004), adults of this species feed on the leaves of Typhaceae and Sparganiaceae. We collected many individuals on the leaves of *Typha angustifolia* at Nishioi, but as regards almost all the individuals on those of *Scirpus* sp. (probably *S. triangulatus*) at Kiwadahata. Regrettably, we were unable to confirm if *Scirpus* is a true host plant of this species or not, though this is highly probable so far as the general floral and habitat situation at Kiwadahata is concerned.

3. *Donacia* (*Donaciomima*) *clavareau* JACOBSON, 1906

BH: 34♂♂, 24♀♀, Kiwadahata, Kimitsu-shi, 20-V-2007, IK; 34♂♂, 8♀♀, same locality, 26-V-2007, KS. All the individuals were collected on *Cyperus* sp. (Cyperaceae).

Of the specimens recorded here, four of *D. (C.) provostii* from Chiba-shi are preserved in the collection of Mr. H. MIYAUCHI, some of the same species from Kimitsu-shi in the collection of the Osaka Museum of Natural History, one specimen of *D. (Donaciomima) bicoloricornis* from Takataki-damu (dam) in the collection of M. MINAMI, and all the remainders in the collection of K. SUZUKI.

Since the 1980's, the second author KAWASHIMA has surveyed mainly odonate fauna at various localities in Chiba Prefecture, especially in the Bôshô Peninsula. Recently, odonate fauna has rapidly declined even in the central and southern areas of the peninsula where primary natural environment and secondary agricultural environment have been preserved in fairly good condition. In order to comprehend the actual circumstances and the changes in the species composition of odonate community from various aspects, we should pay attention to other aquatic insect groups. For this reason, he has also surveyed the donaciine fauna for last several years.

Kiwadahata is located to the southeast of Kimitsu-shi. The habitat of three donaciine species at Kiwadahata is a moor formed along the main stream of the Obitsu-gawa River which runs in a zigzag line. Several small surfaces of the water came to light. KAWASHIMA confirmed the co-existence of *Donacia* (*Cyphogaster*) *provostii* and *D. (Donaciomima) bicoloricornis* several years ago. On June 20, 2007, he also found *D. (Donaciomima) clavareau* inhabiting the moor. One week after SUZUKI also confirmed the co-existence of this species with *D. (Donaciomima) bicoloricornis* there. At this habitat *D. (Cyphogaster) provostii* feeds on *Trapa* sp. (Trapaceae), *D. (Donaciomima) bicoloricornis* on *Scirpus triangulatus* (?), and *D. (Donaciomima) clavareau* on *Cyperus* sp. (Cyperaceae). Sasa is also located to the southeast of Kimitsu-shi. *Donacia* (*C.*) *provostii* feeds on *Potamogeton* sp. (Potamogetonaceae) which densely grow on a small flat moor formed around the flow of cool spring water at the valley head. The moor was formerly an abandoned rice field. Nishioi is located at the western end of Ôtaki-machi and the habitat of *D. (Donaciomima) bicoloricornis* is a small moor formed along a branch of the Yôrô-gawa River. The Nishioi population of the species fed on the leaves of *Typha angustifolia* when KAWASHIMA found its existence for the first time and then KAWASHIMA and SUZUKI observed it in 2007. Though we were unable to confirm it, we infer that *D. (Donaciomima) clavareau* also inhabits there because general circumstances at Nishioi resemble those of Kiwadahata. The Takataki-damu (dam) is located at the middle reaches of the main stream of the Yôrô-gawa River.

Compilation of Known Collecting Data of Six Donaciine Species from Chiba Prefecture

In the following pages we compile all the known collecting data of the six donaciine

species from Chiba Prefecture with some comments on their geographical distribution, host plants, and so on.

Figure 1 is a map showing all the known localities of the following six donaciine species (including those of the three species reported here) from Chiba Prefecture.

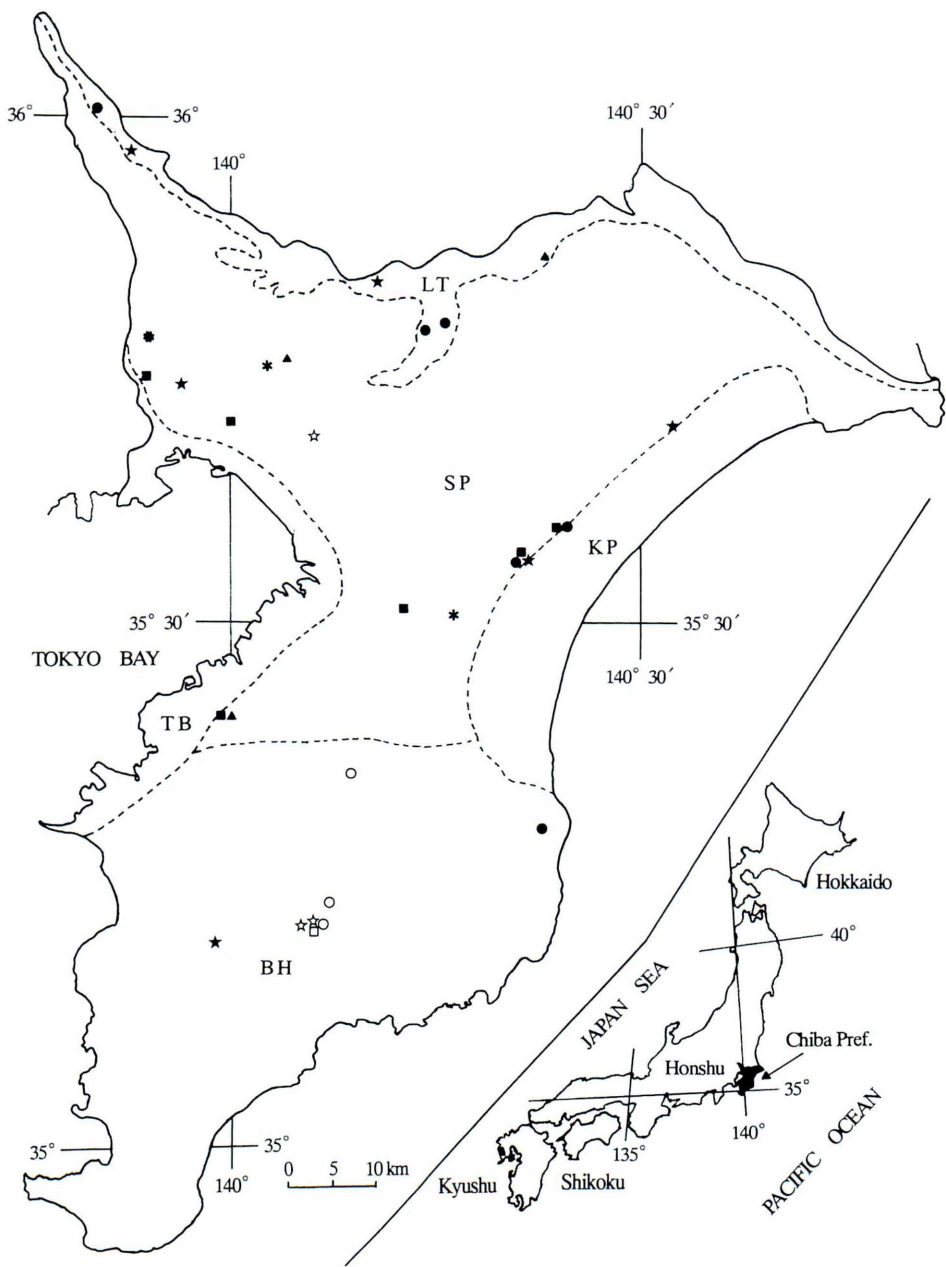
1. *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE, 1885 [Jpn. name: Ine-nekui-hamushi]

Known localities in Chiba Prefecture: LT (Noda-shi [KUBOTA, 1987], Sakae-machi, Inba-gun [YAMAZAKI, 1988, after KUBOTA & ITÔ, 1991]); SP (Ichikawa-shi, [YAMAZAKI & MIYAUCHI, 2004], Tôgane-shi [ITÔ, 1988, after KUBOTA & ITÔ, 1991], Yôka-ichiba (Sôsa-shi) [KUBOTA & ITÔ, 1991]); BH (Mt. Takago-yama, Futtsu-shi, [TAKAKUWA, 1987]).

Distribution. Hokkaido, Honshu, Shikoku, Kyushu, Sado-ga-shima Is., Oki Isls., Tsushima Isls., Gotô Isls., Tane-ga-shima Is., Yonaguni-jima Is.; Far East Russia, Korea, China, Taiwan, SE Asia.

This species is widely distributed in the Japanese Archipelago. However, there are a small number of collecting records from Chiba Prefecture. The only record by only one individual has been reported from the Bôsô Hills. We collected a number of individuals of this species on *Trapa* sp. (Trapaceae) at Kiwadahata in Kimitsu-shi and on *Potamogeton* sp. (Potamogetonaceae) at Sasa in Kimitsu-shi. The Sasa population consists of only very small-sized individuals; i.e., only about 4.5 mm in the smallest male and only about 6.5 mm even in the largest female in the body length. We observed that they did not fly actively at least in the evening though individuals of this species actively fly in general. OHNO (1967) already pointed out the possibility that this species, which had never been found from anywhere in Chiba Prefecture, fed on *Potamogeton* in a moor. TAKAKUWA and TAKAHASHI (1989) reported this species feeding on *Nymphaea tetragona* GEORGI (Nymphaeaceae) and *Potamogeton* sp. in Sawara-ike Pond in Nirasaki-shi, Yamanashi Prefecture, Chûbu District, and pointed out that the population showed a large scale of interindividual variation in body length; i.e., 5.1–6.8 mm in male and 6.8–8.0 mm in female. According to the observation by the senior author SUZUKI in Toyama Prefecture, Hokuriku District, this species generally feeds on *Nelumbo nucifera* GAERTN. (Nelumbonaceae) and rarely on *Nymphaea tetragona*, *Euryale ferox* SALISB. (Nymphaeaceae), *Nymphoides peltata* (GMEL.) O. KUNTZE, *N. indica* (L.) O. KUNTZE (Menyanthaceae), and *Trapa* sp. (Trapaceae). In order to find other habitats of this species in Chiba Prefecture further investigation should be made at various water systems where above mentioned aquatic plants grow.

Fig. 1. Known localities of six donaciine species from Chiba Prefecture, Kantô District, Honshu, Japan. ★: *Donacia* (*Cyphogaster*) *provostii*, known localities; ☆: do, new localities; ●: *D. (Donaciomima)* *bicoloricornis*, known localities; ○: do, new localities; ■: *D. (Donaciomima)* *clavareau*, known localities; □: do, new localities; ★: *Macrolea japana*, known locality; *: *Plateumaris constricticollis babai*, known localities; ▲: *Plateumaris sericea*, known localities. BH: Bôsô Hills; KP: Kujûkuri Plain; LT: lowlands along the Tone-gawa River basin; SP: Shimôsa Plateau; TB: lowlands along Tokyo Bay.



2. *Donacia (Donaciomima) bicoloricornis* CHEN, 1941 [Jpn. name: Kiashi-nekui-hamushi]

Known localities in Chiba Prefecture: LT (Sekiyado-machi, Higashi-katsushika-gun (Noda-shi) [KOMIYA, 1987], Inba-numa (Inba-mura, Inba-gun (Narita-shi) [MATSUBARA, 1988]); SP (Tôgane-shi [ITÔ, 1988; 1989, after KUBOTA & ITÔ, 1991], Narutô-machi (Sanbu-shi) [KUBOTA & ITÔ, 1991]); BH (Misaki-machi (Isumi-shi) [KOMIYA *et al.*, 1986]).

Distribution. Honshu (north of the Kantô District); Far East Russia, China, Taiwan.

This species is distributed in northern Honshu in the Japanese Islands. In Chiba Prefecture it has been known from only in the central and northern regions. We discovered the species in the southern region of the Bôshô Hills. This suggests the possibility that this species generally lives in various regions of the peninsula. It is noted that this species has a remarkably long term in adult activity; i.e., at Kiwadahata in 2007 adults already occurred on 20 May and co-existing situation with *Donacia (D.) clavareau* continued for a while. A number of individuals were observed for a long time after the latter species disappeared. In 2003 the last individual was seen on 20 August. Donaciine species with such a long period of adult activity has never been known from Japan.

3. *Donacia (Donaciomima) clavareau* JACOBSON, 1906 [Jpn. name: Futo-nekui-hamushi]

Known localities in Chiba Prefecture: SP (Ichikawa-shi [NARUSE, 2007], Funabashi-shi [FUKAGAWA, 2005b], Tôgane-shi [ITÔ, 1988; 1989, after KUBOTA & ITÔ, 1991], Narutô-machi, Sanbu-gun (Sanbu-shi) [KUBOTA & ITÔ, 1991]), Ichihara-shi [MIYAUCHI, 2005], Sodegaura-shi [Sodegaura-shi Kyôiku Iinkai (ed.), 1997]).

Distribution. Honshu (north of the Kantô District), Kyushu; Far East Russia, China, Mongolia.

This species has been reported from various places in the Shimôsa Plateau (ITÔ, 1988; 1989, after KUBOTA & ITÔ, 1991; Sodegaura-shi Kyôiku Iinkai (ed.), 1997; FUKAGAWA, 2005b; MIYAUCHI, 2005; NARUSE, 2007). We found this species at several places of the northern and central regions of the Bôshô Hills. This species will be discovered hereafter in various localities in Chiba Prefecture. The co-existing of this species with the former one has been known from several localities in the Shimôsa Plateau. We also confirmed such a co-existing situation of these two species in the moor at Kiwadahata. In general adults of this species occur from late April to late June in lowland areas of the Kantô District. The peak of adult activity is the period during early May to early June but adults have been observed until late July at some localities. At Kiwadahata this species nearly disappears till the end of June.

4. *Macrolea japana* (JACOBY, 1885) [New Jpn. name: Minami-kiiro-nekui-hamushi]

Known localities in Chiba Prefecture: SP (Matsudo-shi [YUASA, 1926]).

Distribution. Honshu, Kyushu; China.

This species has been recorded so far from a few localities in Chiba and Kanagawa

(type locality) Prefectures (Kantô District), Shiga and Hyôgo Prefectures (Kinki District), and Fukuoka Prefecture (Kyushu). The record from Chiba Prefecture was made by YUASA (1926) who found two individuals in the stomach contents of a frog *Rana porosa porosa* (COPE). Since a record from Fukuoka Prefecture in 1962 (KIMOTO, 1964), this species has never been found in the Japanese Archipelago for 56 years. Consequently, this species has been considered already to become extinct during recent several decades. Recently, HORI (2006) reported the discovery of *Macrolea mutica* (FABRICIUS, 1792) from the damp plains of Kushiro (Kushiro Shitsugen), Hokkaido, in 2004. This species was occasionally treated as the nominotypical subspecies of the species; i.e., according to this opinion *M. japana* should be regarded as a subspecies of *M. mutica*, *M. mutica japana*. HORI pointed out the possibility that the host plant is *Myriophyllum spicatum* L. (Haloragaceae). However, some workers (e.g., HAYASHI & SOTA, 2007) regarded these two subspecies as independent species, respectively. An exhaustive investigation should be conducted in the water system, where the *Myriophyllum* plants grow, in various districts of Japan.

5. *Plateumaris constricticollis babai* CHÛJÔ, 1959 [Jpn. name: Shinano-ô-nekui-hamushi]

Known localities in Chiba Prefecture: SP (Funabashi-shi [YAGI 1991; HAYASHI, 2005], Chiba-shi [NAOMI, 2004]).

Distribution. Honshu (Chûbu District).

This species was reported from Funabashi-shi and Chiba-shi in the Shimôsa Plateau. Based on the known geographical distribution of the species, the populations from Chiba Prefecture are obviously relicts as YAGI (1991) and KOMIYA (1991) pointed out. YAGI (1991) surmised that they are the relict populations which moved south in the Würm Period. The populations of this species living in Chiba Prefecture are zoogeographically very important and their preservation is strongly desired as KOMIYA (1991) emphasized. Recently, SOTA *et al.* (2007) reported on geographical variation of body and ovipositor sizes in this species. They discussed inter- and intrasubspecific differentiation of three subspecies (*constricticollis* JACOBY, 1885, *babai*, and *toyamensis* TOMINAGA *et* KATSURA, 1984) of this species in the Japanese Archipelago (Hokkaido and Honshu) based on different habitat conditions (especially climatic conditions as the depth of snow), host plants, genetic differentiation (haplotypes of the 28S rRNA), and so on. SOTA and HAYASHI (2007) also discussed historical biogeography of five *Plateumaris* species from Japan based on sequence data from a 750 bp portion of the COI gene. According to them the Chiba (Funabashi and Midori-ku) populations along with other nine populations of the subspecies *babai* form a closely united cluster, though the former population is geographically isolated from the latters.

6. *Plateumaris sericea* (LINNAEUS, 1758) [Jpn. name: Kinutsuya-nekui-hamushi]

Known localities in Chiba Prefecture: LT (Shimôsa-machi (Narita-shi) [Kubota, 1987]), SP (Funabashi-shi [FUKAGAWA, 2005b], Sodegaura-shi [Sodegaura-shi Kyôiku Inkai (ed.), 1997]).

Distribution. Hokkaido, Honshu, Kyushu, Sado-ga-shima Is.; S. Kurile Isls.

(Kunashiri-tô Is. & Etorofu-tô Is.), Sakhalin, Far East Russia, Central Asia, Europe, Korea, China, Mongolia.

This species is widely distributed mainly in northern Japan and occurs in various environments from lowlands to high mountain areas. In the Kantô District this species has been reported from various localities. As the known habitats of this species in Chiba Prefecture are considerably restricted to the lowlands along the Tone-gawa River (LT) and Funabashi-shi and Sodegaura-shi in the Shimôsa Plateau (SP), intensive investigation should be conducted especially in central and southern areas of the Bôso Peninsula.

Donacia (*Donaciomima*) *splendens hiurai* KIMOTO, 1963 was reported by FUKAGAWA (2005a) from Funabashi-shi [SP]. This species is distributed in Honshu (northeast of the Chûbu District). In the Chûbu District, this species occurs in a moor at high altitude, but it has been known from lowlands in the northern area of the Kantô District. Through the courtesy of Mr. FUKAGAWA we were able to examine the specimen from Funabashi-shi and clarified that the record of the species was based on misidentification of *Plateumaris sericea*. Consequently, this species should be omitted from the donaciine fauna of Chiba Prefecture (see also MIYAUCHI, 2007). However, according to HAYASHI (pers. comm.), a semi-fossilized dead body of this species was discovered from the remains in Chiba Prefecture. It is therefore possible that this species still survives somewhere in this prefecture.

Future Problems for Elucidating the Donaciine Fauna in Chiba Prefecture

The biogeographical significance of the insect fauna in Chiba Prefecture has been discussed by several workers. The following species are well-known representatives who have occasionally provided controversial topics: the so-called red-form of *Carabus* (*Ohompterus*) *insulicola* CHAUDOIR, 1869 (subsp. *nishikawai* ISHIKAWA, 1966; recently it was included in the nominotypical subspecies by UJIE & ISHIKAWA (2005)) (Coleoptera, Carabidae), a white-winged form (f. *edai* ASAHINA, 1985) of *Mnais costalis* SELYS, 1869 (Odonata, Calopterygidae), *Tetrix wadai* UCHIDA et ICHIKAWA, 1999 (Orthoptera, Tetrigidae), and *Panchala ganesa loomisi* (PRYER, 1886) (Lepidoptera, Lycaenidae).

The chrysomelid fauna of Chiba Prefecture was intensively analyzed and discussed by OHNO (1967). He reported 139 species mainly based on the collecting data of preserved specimens, most of which were obtained by himself. Concerning the Donaciinae, only the known record of *Macrolea japonica* (JACOBY, 1885) (YUASA, 1926) was cited in his report. In fact the donaciine fauna of Chiba Prefecture was not well surveyed before the end of the 1960's. Recently, FCPSHM (ed., 2003) published a check-list of all the animals which have been recorded theretofore from Chiba Prefecture. A total of 212 chrysomelid species (excluding 10 bruchid species which were treated here as a subfamily of the Chrysomelidae) were picked up in the check-list in which six donaciine species of three genera were included.

The donaciine fauna of Chiba Prefecture shows some peculiarities from the

zoogeographical viewpoint. Regrettably, reliable information has not been provided for discussing the processes of formation of the donaciine fauna in this prefecture. In addition to five species which were already known from Chiba Prefecture, two peculiar species, *Plateumaris constricticollis babai* and *Donacia (Donaciomima) splendens hiurai*, were recently reported from much localized areas in this prefecture, though the record of the latter was based on a misidentification of *P. sericea* as already mentioned. YAMAZAKI (2003) gave six species with the areas recorded. HAYASHI (2005, 2006) compiled most of the known collecting records of the Japanese donaciine species. He listed seven species (including *D. (Donaciomima) splendens hiurai*) of three genera recorded from Chiba Prefecture.

As aquatic or semiaquatic environment, where donaciine beetles generally inhabit, has been rapidly declined, comprehension of the present situation of the donaciine community should be considered to be an important problem of great urgency.

There are several donaciine species showing punctured or disjunctive geographical distribution pattern. In some species like *Plateumaris constricticollis babai* and *P. sericea* inhabiting lowland areas of the Kantô District, distinctly relict populations appear to live at intervals due to retreat of glaciers. Since the 1980's, a large scale of exploitation of land has brought a rapid pollution of water system and destruction of habitats of diverse organisms especially of aquatic and semiaquatic plants and animals including the Donaciinae especially at level ground to lowlands.

The geographical distribution of *Donacia (Donaciomima) clavareaui* is much limited in the Tôhoku and Kantô Districts, Honshu, and at the same time much separately in Fukuoka Prefecture, Kyushu. This species is also distributed in North China. Similarly *Donacia (Donaciomima) flemora* GOECKE, 1944 is distributed in northern Honshu and one habitat each is known from Yamanashi and Nagano Prefectures (Chûbu District). Moreover, this species also occurs separately in several localities of Tottori and Hiroshima Prefectures (Chûgoku District) in southwestern Honshu and the Korean Peninsula and North China. The geographical distribution pattern of these two species seems very unusual but such apparently similar disjunctive geographical distribution is also known in *Chrysolina virgata* (MOTSCHULSKY, 1860) (Chrysomelinae) (IWAI & YAGI, 2003). According to HAYASHI (pers. comm.), a semi-fossilized body of *Donacia (Donaciomima) flemora* was very recently found in Chiba Prefecture. This suggests the possibility that the species as well as *Donacia (Donaciomima) splendens hiurai* still exist somewhere in Chiba Prefecture. *Donacia (Donaciomima) nitidior* (NAKANE, 1963) is indigenous to Honshu and is known from the region from northern area of the Tôhoku to Kantô Districts in northern Honshu and separately from the region from the Kinki to Chûgoku Districts in southwestern Honshu. There is a very broad blank area from the Chûbu, Hokuriku and Tôkai Districts between the above two distributional regions of this species.

As mentioned above it can be said that all of six donaciine species from Chiba Prefecture show a unique distributional pattern even though the degree of investigation is not very high. *Donacia (Cyphogaster) provostii* is widely distributed from Southeast

Asia to Far East Asia including the Japanese Archipelago. However, there are various scales of blank areas in its geographical distribution even within the Japanese Archipelago. This suggests the possibility that every donaciine species occasionally shows such a punctured or disjunctive geographical distributional pattern reflecting the peculiarity in their adaptation to special habitats and the geological history of the latter. The isolating populations will also be found for many other donaciine species in various regions.

As compared with other districts, the present living situation in donaciine species in the Kantô District has been considerably revealed. A total of 12 donaciine species have been recorded from Ibaraki and Tochigi Prefectures where the number of donaciine species is most abundant in Japan and is nearly equivalent to that in Fukushima Prefecture in the Tôhoku District. In the Kantô District eight donaciine species are known from Gumma Prefecture and five species each from Saitama, Tokyo, and Kanagawa Prefectures. Considering the present situation mentioned above and species composition of the donaciine fauna in the Kantô District, the existence of the following two species in Chiba Prefecture deserves special mention: *Plateumaris constricticollis babai* and *P. sericea*. Taking everything into consideration, we came to the conclusion that *Donacia* (*Cyphogaster*) *lenzi* SCHÖNFELDT, 1888 is the most expected species to be newly found hereafter from Chiba Prefecture. One should pay attention to the pond, marsh, or moor where *Nymphaea* and/or *Brasenia* plants of its hosts grow. *Donacia* (*Donaciomima*) *nitidior* (NAKANE) (main hosts: *Carex* spp.) and *Donacia* (*Donaciomima*) *vulgaris* ZSCHACH, 1788 (main hosts: *Typha* spp., *Sparganium* spp.), which have been recorded from Tokyo (MINAMI, 1987; MINAMI & KOMIYA, 2005), may also be found in Chiba Prefecture. The latter species is distributed in North Japan, and recently its isolated populations were found in Tokyo (MINAMI & KOMIYA, 2005) and Fukui Prefecture (Hokuriku District) (unpublished; TAKEDA, pers. comm.).

Phytophagous insects largely and inevitably depend on the existence of host plants in their habitats. They must also have means to move to new habitats from the place where they already settled down. What habitat is stably kept for a long time is indispensable for their long term existence. It should be pointed out that the existence of a given donaciine species is also strongly disturbed and conditioned by various factors, e.g., dispersal by migratory aquatic birds, artificial transplantation of aquatic plants to a new habitat when artificial preparation or change of water system is made for the cause of preservation of 'natural' environment. The constructions of odonate and bird sanctuaries or biotopes are good examples of the latter. In fact such an artificial change of 'natural' environment has given serious influence to the fauna and flora in the place concerned. One should comprehend precisely the fauna and flora in a given locality and then make effort to reveal the factors determining the distributional pattern for each species. Donaciine fauna may show a good material for considering the biogeographical and conservation biological problems.

Acknowledgements

We wish to express our deep gratitude to Dr. Shun-Ichi UÉNO of the National Museum of Nature and Science, Tokyo, for critically reading the manuscript of this paper. We deeply thank Prof. Emerit. M. OHNO (Toyo University), the late Prof. Emerit. Y. KOMIYA (Gumma University), Dr. M. HAYASHI (Hoshizaki Green Foundation), Mr. H. MIYAUCHI (Chiba Prefecture), Dr. S. SHIYAKE (Osaka Museum of Natural History), Mr. M. AYATO (Chiba Prefecture), Mr. Y. FUKAGAWA (Chiba Prefecture), and Mr. S. TAKEDA (Shiga Prefecture) for helping us in various ways. We would like to express our special thanks to Dr. S. NISHIHARA (Tokyo University) who kindly gave a valuable comments on our manuscript from the standpoint of conservation biology.

Additional Note

After the completion of the manuscript, MIYAUCHI (2007) corrected and omitted the record of *Donacia (Donaciomima) splendens hiurai* from Chiba Prefecture as misidentification. MIYAUCHI, H., 2007. Correction of the data of *Donacia (Donaciomima) splendens hiurai* from Chiba Prefecture. *Bôsô-no-Konchû*, Yotsukaidô, (39): 110. (In Japanese.)

要 約

鈴木邦雄・川島逸郎・南 雅之：千葉県におけるイネネクイハムシ，キアシネクイハムシおよびフトネクイハムシの新産地—付：千葉県のネクイハムシ相解明にあたっての今後の課題—。—— 千葉県下では既知産地の少ない3種のネクイハムシの新産地（いずれも房総半島中南部）を報告した。千葉県から記録のあるネクイハムシ類7種すべての既知産地をまとめ，ヒウラヒラタネクイハムシの記録を誤同定に基づくものとして除外し，残りの6種についておもに動物地理学上の問題点を指摘し，千葉県のネクイハムシ相の解明にあたっての今後の課題について論じた。

Literature

- FUKAGAWA, Y., 2005 a. First collecting record of *Donacia splendens* from Chiba Prefecture. *Bôsô-no-Konchû*, Chiba, (34): 73. (In Japanese.)
- 2005 b. Two donaciine species collected in Funabashi-shi, Chiba Prefecture. *Ibid.*, (35): 30. (In Japanese.)
- HAYASHI, M., 2004. Revisional study on Japanese members of Donaciinae (Coleoptera: Chrysomelidae). *Bull. Hoshizaki Green Foundation, Izumo*, (7): 29–126. (In Japanese with English abstract.)
- 2005. Distributional records of Donaciinae (Coleoptera, Chrysomelidae) in Japan. Part 1. Genus *Plateumaris* THOMSON. *Ibid.*, (8): 39–70. (In Japanese.)
- 2006. Distributional records of Donaciinae (Coleoptera, Chrysomelidae) in Japan. Part 2. Genera *Donacia* FABRICIUS and *Macrolea* SAMOUELLE. *Ibid.*, (9): 151–192. (In Japanese.)
- & T. SOTA, 2007. Ecological observations of three Canadian species of the genus *Neohaemonia* (Chrysomelidae, Donaciinae). *Gekkan-Mushi*, Tokyo, (434): 16–19. (In Japanese.)

- HORI, S., 2006. New record of *Macrolea mutica* (FABRICIUS) from Japan (Coleoptera, Chrysomelidae). *Ibid.*, (422): 10–12. (In Japanese.)
- IWAI, D., & T. YAGI, 2003. Geographical distribution of *Chrysolina virgata* (MOTSCHULSKY) (Coleoptera: Chrysomelidae) in Japan. *Jpn. J. Ent.*, (N. S.), 6: 105–110. (In Japanese with English summary.)
- KOMIYA, Y., 1987. Collecting records of Donaciinae in 1986. *Donaciist, Yokohama*, (1): 21–23. (In Japanese.)
- , 1991. Biogeographical significance of a local population of *Plateumaris constricticollis babai* CHÛJÔ, 1959 discovered at Funabashi-shi in Chiba Prefecture, with a proposal for its preservation. 7 pp., Society for the Study of Donaciinae, Yokohama. (In Japanese.)
- , S. OHMOMO & M. TAKAKUWA, 1986. Collecting and observation records of the Donaciinae in 1985. *Coleopterists' News, Tokyo*, (71): 5–6. (In Japanese.)
- KUBOTA, M., 1987. Collecting records of Donaciinae in 1986. *Donaciist, Yokohama*, (1): 3–6. (In Japanese.)
- & T. ITÔ, 1991. The donaciine fauna in Chiba Prefecture. *Ibid.*, (4): 3–5. (In Japanese.)
- MATSUBARA, Y., 1988. Collecting record of *Donacia* (*Donacia*) *bicoloricornis* from Inba-numa, Chiba Prefecture. *Ibid.*, (2): 17. (In Japanese.)
- MINAMI, M., 1987. Collecting records of two donaciine species from Lake Sayama-ko and Lake Tama-ko. *Ibid.*, (1): 23. (In Japanese.)
- & Y. KOMIYA, 2005. Collecting records of *Donacia vulgaris* and *Plateumaris sericea* from Akiruno-shi, Tokyo. *Gekkan-Mushi, Tokyo*, (418): 16. (In Japanese.)
- MIYAUCHI, H., 2005. Collecting record of *Donacia clavareau* from Ichihara-shi, Chiba Prefecture. *Bôsô-no-Konchû, Chiba*, (35): 31. (In Japanese.)
- NAOMI, S., 2004. Collecting record of *Plateumaris constricticollis babai* CHÛJÔ (Coleoptera, Chrysomelidae) from Chiba-shi, Chiba Prefecture. *Ibid.*, (32): 56. (In Japanese.)
- NARUSE, K., 2007. Existing conditions of *Donacia* (*Donaciomima*) *clavareau* in Junsai-ike Pond in Ichikawa-shi, Chiba Prefecture. *Ibid.*, (39): 69. (In Japanese.)
- OHNO, M., 1967. The chrysomelid-fauna of Chiba Prefecture, Honshu, Japan. *Chiba-ken Dôbutsu-shi Kiso Shiryô*, 6: 5–41. (In Japanese.)
- Sodegaura-shi Kyôiku Inkai (Board of Education in Sodegaura-shi) (ed.), 1997. Insects data - Coleoptera. pp. 79–87, *Animals in Sodegaura*. 90 pp. (In Japanese.)
- SOTA, T., & M. HAYASHI, 2007. Comparative historical biogeography of *Plateumaris* leaf beetles (Coleoptera: Chrysomelidae) in Japan: interplay between fossil and molecular data. *J. Biogeogr.*, 34: 977–993.
- , & T. YAGI, 2007. Geographical variation in body and ovipositor sizes in the leaf beetle *Plateumaris constricticollis* (Coleoptera: Chrysomelidae) and its association with climatic conditions and host plants. *Eur. J. Entomol.*, 104: 165–172.
- TAKAKUWA, M., 1987. Two collecting records of *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE from southern area of the Kantô District. *Donaciist, Yokohama*, (1): 27. (In Japanese.)
- & K. TAKAHASHI, 1989. First record of *Donacia* (*Cyphogaster*) *provostii* FAIRMAIRE from Yamanashi Prefecture, Honshu, Japan. *Ibid.*, (3): 12. (In Japanese.)
- UJIE, M., & R. ISHIKAWA, 2005. Geographical variation of *Carabus* (*Ohomopterus*) *insulicola* (Coleoptera, Carabidae). pp. 58–61. In YAHIRO, K., & K. MASUNAGA (eds.), *The Carabid Ground Beetles, Walking Jewels — Marvelous discoveries about these flightless insects*. 123 pp., Lake Biwa Museum, Kusatsu. (In Japanese.)
- YAGI, T., 1991. Discovery of *Plateumaris constricticollis* population in lowlands of Funabashi-shi, Chiba Prefecture. *Donaciist, Yokohama*, (4): 5. (In Japanese.)
- YAMAZAKI, H., 2003. The order Coleoptera (pp. 207–258). In The Foundation of Chiba Prefecture for the Study of Historical Materials (ed.), *A Check-list of Animals occurring in Chiba Prefecture*. xi + 378 pp. The Foundation of Chiba Prefecture for the Study of Historical Materials, Chiba. (In Japanese.)
- & H. MIYAUCHI, 2004. Coleoptera in Ichikawa-shi, Chiba Pref. II (pp. 751–853). In Ichikawa-shi & Ichikawa-shi Shizen Kankyô Chôsa-kai (eds.), *Ichikawa-shi Shizen Kankyô Jittai Chôsa Hôkoku-sho 2003*. pp. 505–1033. Ichikawa-shi Kankyô-seisô-bu Shizen-hogo-ka & Ichikawa-shi Shizen Kankyô Chôsa-kai, Ichikawa. (In Japanese.)
- YUASA, H., 1926. A rare chrysomelid species found in a frog stomach. *Kontyû, Tokyo*, 1: 124–125. (In Japanese.)